

## Influence of slow bed aggradation/degradation on river meandering

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It is commonly observed that rivers frequently change their courses under bed aggradation, and they do not shift their courses under degradation. In this study, influence of bed aggradation and degradation on river meandering is clarified with the use of linear stability analysis. In the analysis, we introduce the ratio between the time scales of channel shift and bed aggradation/degradation as a small parameter. Applying the multiple scale method and the WKBJ method with the small parameter to the formulation of river flow described by shallow water flow equation and the time variation of bed elevation by Exner equation, the growth rate of perturbation is derived as a function of the aspect ratio and the wavenumber of meandering. It is found that unstable region increases in the aspect ratio-wavenumber plane in the case of bed aggradation while stable region expand in the case of bed degradation. The implication is that river channels have high tendency to meander when bed aggradation takes place while straight channels tend to be maintained when bed degradation takes place.

Keywords: aggradation, degradation, meandering, linear stability analysis